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EXCAVATION OF EARTH-LODGE RUINS IN EASTERN NEBRASKA

By ROBERT F. GILDER

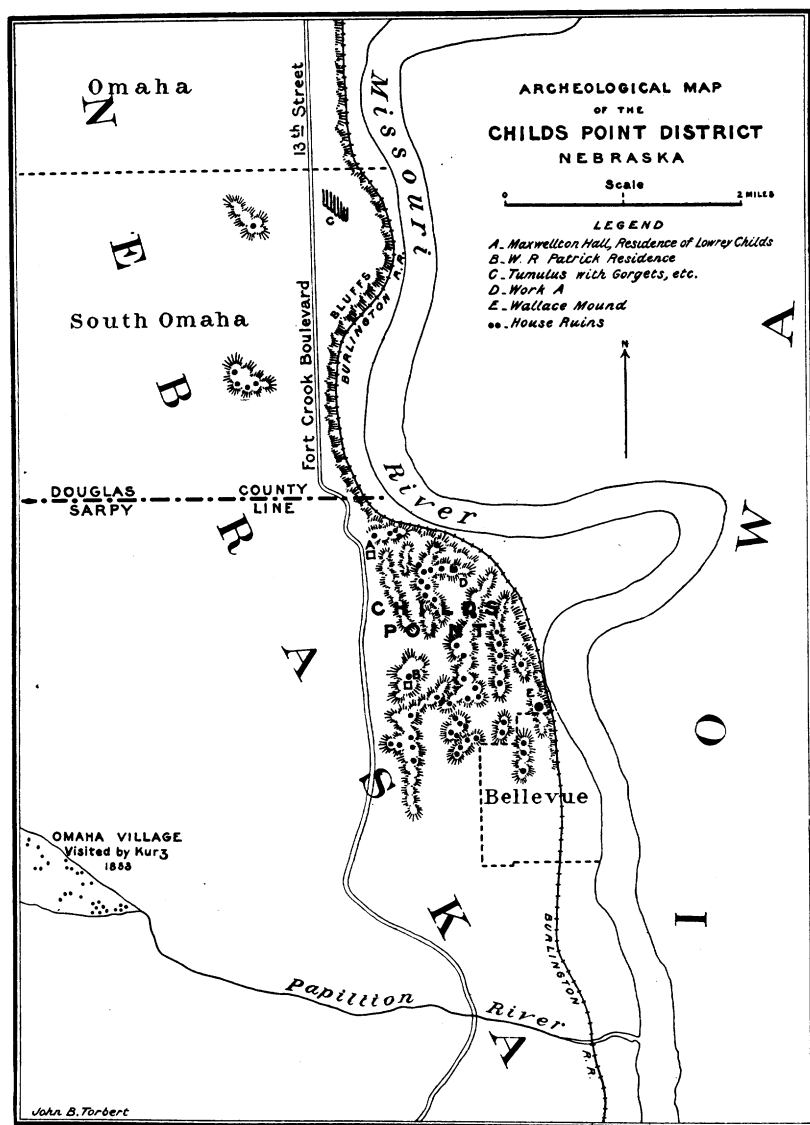
WITH A REPORT ON THE SKELETAL REMAINS BY ALEŠ HRDLIČKA

THE RUINS IN GENERAL

ANNOUNCEMENT was made by the writer in this journal for January-March, 1908, of the supposed rediscovery of an Oto village north of the mouth of Platte river, in the valley of the Missouri, mentioned by Lewis and Clark, Major S. H. Long, and other early explorers of the Missouri river. After ten months' exploration of house ruins and tumuli in the area of the village, the writer has found an apparent affiliation between the method of house construction and the artifacts of this village, and many other circular house ruins, locally known as "buffalo wallows," scattered with little order along the left bank of the Missouri from the mouth of the Platte to the northern line of Washington county, Nebraska, a distance of approximately fifty miles.

Careful exploration in and a long study of the ruin of one house within the area of the supposed Oto village has determined positively that it differed materially from others near it. Its probable original construction was the writer's chief study, and the large and varied collection of artifacts secured was of secondary importance. The details of probable original construction, carefully noted throughout the entire work, were observed particularly at the suggestion of Dr Clark Wissler, of the American Museum of Natural History.

My associates during the labor of exploration, always voluntary, were Samuel P. Hughes, John B. Gallatin, J. E. Wallace, H. Jewell, Rev. R. W. Livers, and Everard Childs, the last a son of the owner of the property, Mr Lowrey Childs, into whose possession the objects found in the ruins have been given and where they will be available for study.



IG. I.

The ruin first explored is situated at the summit of a high and narrow ridge extending eastward almost at a right angle with the river bluffs nearly a mile from their north-south line, at a point

where the Nebraska and Iowa hills are separated by a distance of four miles. On the surface the ruin was similar to that of Work No. 1, Ponca Creek district, previously described by the writer,¹ with the exception that it was sixty feet in diameter, measured from the outside of the rim, and deeper by nearly four feet in the center of the depression.

The work of excavation was begun on the western side of the ruin, five feet from its rim. A ditch six feet wide, and deeper by one foot or more than the house floor, was carried southeastward and around the outer base-line of the floor for four-fifths of its circumference. This would have been a complete circle six feet wide but for a linden tree, sixteen inches in diameter, which grows five feet inside the rim in the northwestern portion, compelling a narrowing of the ditch that the tree might be preserved. A detailed description of the work of exploration would be but a repetition of that of Work No. 1, Ponca Creek district, and is therefore omitted. For the purposes of this paper it may be here stated that the earth inside a circle fifty feet in diameter to a depth of five to ten feet was thoroughly examined.

In all house ruins similar to the one here described, the main fireplace, four to five feet in diameter, is situated near the exact center. From this fireplace the floor extends, nearly flat, to within ten feet of the extreme outer edge or periphery of the ruin. Here a platform, or step, twelve to fourteen inches high and almost vertical, rose from the floor and sloped rather sharply to the outer rim (fig. 2, *a*). On the southeastern side of the ruin a ditch was dug through this platform to the extreme outer edge, the sides of which gave the exact angle of the slope.

Around the line of the inner circumference of the platform, at distances of approximately five feet, the remains of posts six or seven inches in diameter were discovered. These were either in the form of charcoal or of wood dust. Sometimes boulders lay about the remains of the posts, as if designed to aid in holding them in position. The grain of the charcoal posts indicated the wood to have been oak. About the posts, under the floor, and also under the platform, objects were more numerous than at other points in

¹ *American Anthropologist*, October-December, 1907.

the ruin. The charred remains of four posts about eight feet apart surrounded the central fireplace.

There were two features of house construction that stand out conspicuously: (1) the floor was approximately six to eight feet lower than the level of the surrounding ridge; (2) the angle at which the slabs, logs, or palings probably leaned inward from the periphery seems to indicate the highest part of the roof at about the same distance above the surrounding level as the floor was below, making the highest part of the roof about fifteen feet above the fireplace in the center of the dwelling.

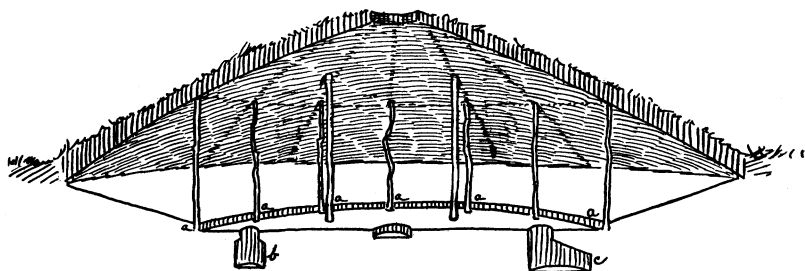


FIG. 2. — Section showing floor, platform, fireplace, position of posts, and probable arrangement of roof. (*a*, elevated "step"; *b*, *c*, caches.)

A prism cut from a section of the ruin half-way between the inner edge of the platform and the fireplace, shows twenty inches of vegetal mold, thirty inches of roof-covering, and about twelve inches of earth constituting the floor. The floor was a distinctive feature. It appeared to be composed of packed or rammed clay through which were mixed ashes and flakes of charcoal in great profusion. This clayey appearance differs from the loess with which the roof was covered, being darker and very compact.

Little besides broken flint implements, flint chips, shells, potsherds, and fractured drift boulders were found upon the floor itself; the major number of objects was beneath the floor surface, very often covered with boulders, as if the latter had been placed to mark the spot. Small fireplaces were of frequent occurrence on all parts of the floor.

Three caches were found in the first ruin, which for convenience will be designated as Work A. In one, fifteen feet west of the

center of the dwelling (fig. 3, *a*), were found flint blades, a score of *Unio* shells, a mano or muller made from a rounded drift boulder, its lower or grinding edges beveled, probably from contact with the sides of the mortar, and a pottery pipe in form of a soaring bird. The mortar itself was not found, although careful search was made for it throughout the ruin. Five broken metates, however, were found. The bottom of this cache was six feet from the surface.

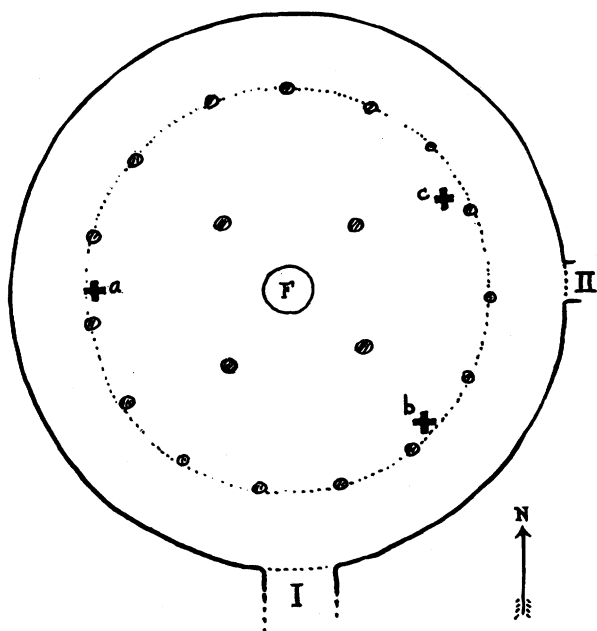


FIG. 3.—Ground-plan of earth lodge, Work A. (*a*, *b*, *c*, position of the three caches. I, II, the entrances. The small hatched circles are posts. The inner circle is the step or inner edge of the platform. *F*, fireplace. The outer circle is the periphery of the ruin.)

The second cache lay at the southeastern side of the ruin (fig. 3, *b*). Its bottom was eight feet from the surface of the ground. It contained thirty shells, several large flint blades, other large flint implements of unknown use, one of which closely resembles a spokeshave, animal bones, projectile points, and a small piece of galena.

The third cache, in the northeastern part of the ruin, was the

largest and deepest of the three, its bottom being nine feet and a half from the surface (fig. 3, *c*). On a small shelf, or niche, at its eastern side, two feet from the bottom, lay a small image of a human face carved from pink soapstone, a number of animal bones and skulls, fish bones and scales, and *Unio* shells.

So many and varied were the objects found in the ruin, so abundant the charred sticks and grasses, that the impression is conveyed that the dwelling had been abandoned in haste and that it had burned to the ground, as stone required in implement making, with the exception of quartzite and granite drift boulders, is not found in this vicinity.

All of the ruins of the type here described are accompanied by refuse heaps covered with nearly two feet of vegetal mold and sandy earth containing potsherds, broken flint implements, flint chips, and, some of them, broken shells. No animal bones have yet been found. These refuse heaps usually occur twenty-five to fifty feet to the right of the southern entrance of the dwelling.

The situation of the house ruins on Childs Point — as the land on which the village is locally known — seems a feature of their variation. From the city of Omaha, four miles north, Childs Point extends in what seems in the distance to be an unbroken line eastward out into the river-bottoms at an elevation of about two hundred feet; but instead of being an unbroken point of land, it is in reality composed of a succession of heavily-wooded parallel ridges extending north and south with deep cañons between them. Occasionally a ridge extends east and west, and it is on one of the latter, which covers an area of about four acres, that Work A is situated (fig. 1). At its western end it is joined by another ridge extending southward. Eight ruins are situated on these two ridges, five on the former and three on the latter. One of the former ruins on the western end of the ridge, sixty feet in diameter, is joined at the southwest by a smaller ruin twenty feet in diameter. Excavation in the center of the smaller ruin determined that it was not a cache similar to the caches made by the Omaha. An ash-bed nearly two feet in thickness indicated long occupancy. (See fig. 4.)

A dozen feet south of these two ruins are five long and narrow mounds, extending east and west, two to three feet higher than the

surrounding level. They are seventy-five feet long by twenty-five wide, placed end to end, with depressions several feet wide between each. The writer was compelled to pass these mounds twice each week for three months in order to reach Work A, and became convinced that their similarity and extent was due to their having been erected as a continuous wall or breastwork. When opportunity presented, a trench was dug across one of the mounds, and another, east and west, crossed the first at right angles. At the juncture of the two trenches, two feet from the surface, a bone fish-hook of singular pattern was found (pl. 1, 2, *e*). This implement has a flattened elbow and is supplied with notches on the elbow's outer curve.

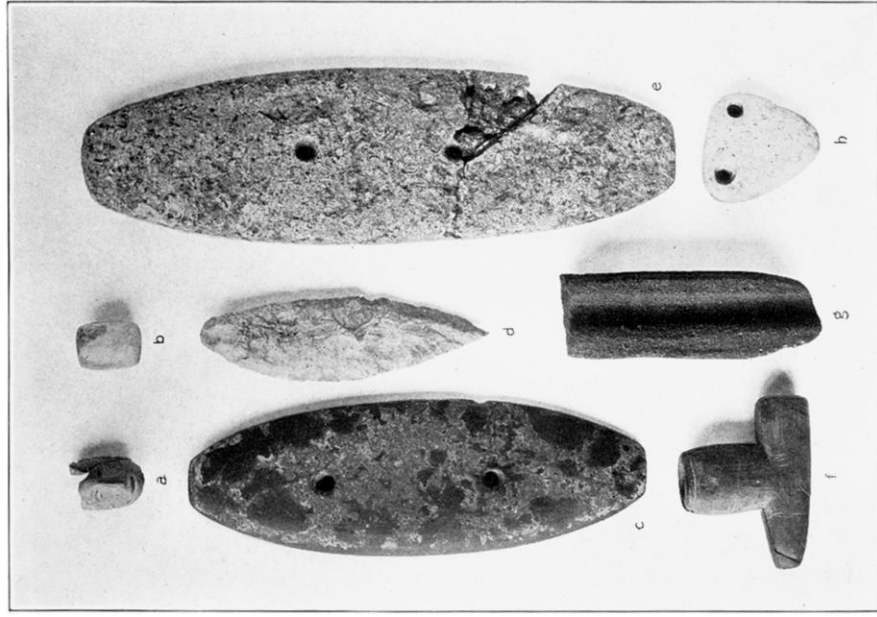


FIG. 4. — Earth lodge ruins. The figure stands in the center of the large ruin. Small ruin at the extreme right.

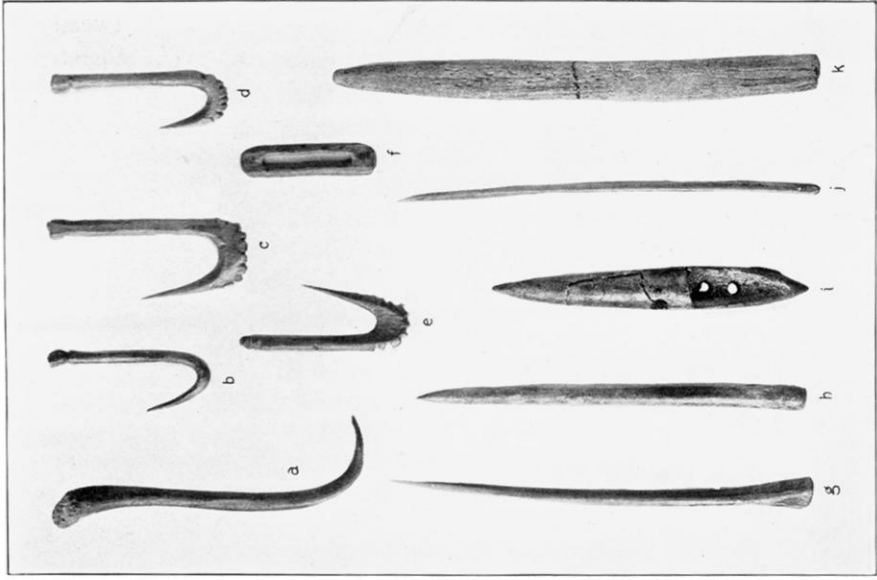
An inch or two below the fish-hook was a bone bodkin, and two feet still lower down, lying on what appeared to be the top of the hill, was a human skull and, to the eastward thereof, some of the long-bones of the skeleton. The frontal bone is wanting, but the mandible, maxilla, frontal processes of maxilla, and zygomatic arch were with the other parts of the skull. Such of these bones as were recovered were sent to the United States National Museum for examination by Dr Hrdlička.¹

Five feet east of the north-south trench, and on the same level

¹See specimen 251,893 in the accompanying report by Dr Hrdlička, page 80.



1. *a*, Sculptured head of pink soapstone; *b*, Quartz bead; *c*, *e*, *e*, Gorgets; *d*, Four-bladed flint knife; *f*, Soapstone pipe; *g*, Arrowshaft smoother; *h*, Stone pendant.



2. *a-e*, Bone fish-hooks; *f*, Bone buckle; *g*, *h*, *j*, Bone needles; *i*, Antler object, possibly for weaving nets; *k*, Antler object of unknown use.

as the bones, was an ash-bed four feet in irregular diameter and three inches in thickness. The mound was composed of alternate layers, six to eight inches thick, of light sandy loess and darker soil. It contained broken drift spalls, calcined granitic rock, pumice, potsherds, and shells. The ware is similar to that from Work A, and several decorated pot-rims bear precisely the same designs as those from the latter ruin.

The extent of the nearest ruins leads to the belief that most of the earth forming the mounds was taken from them at the time of the building of the lodges and was deposited as a fortification or wall of some kind which was used afterward as a sepulcher. Three hundred yards south of these earthworks, on the ridge extending in that direction, the writer opened a low tumulus in which were the calcined bones of three human skeletons, all of which were much deteriorated. The bones lay, without apparent order, beneath large slabs of limestone, covered with three feet of earth. Such of the bone fragments as could be removed were sent to Dr Hrdlička for examination.

One mile south of Work A someone had dug three short trenches in the ruin of an earth lodge similar to that of Work A. Examination gave assurance that no cache had been found. The writer extended one of the trenches on the western side of the ruin to within eight feet of its rim, and at a depth of six feet from the surface found a cache from which four-hundred objects of antler, bone, pottery, shell, and stone were obtained, including a head made of burnt clay, and a bead formed from a quartz pebble ground down to shape and drilled through from both ends. The bead is an inch in length and half an inch in diameter (pl. I, 1, *b*). Other objects of interest are large and small "hoes" formed from the scapulæ of bison, elk, and smaller animals; punches, needles, fish-hooks (plain and notched at elbow), all of bone; pot-lugs; paint-pots and rims; a ground diorite celt; whole and broken pottery pipes; a fish carved from a shell and probably used as a pendant; bone beads (pl. III, 1, *f*), antler objects of unknown use; arrowshaft smoothers; drills; projectile points and flint knives; blades and scrapers; small piles of unworked flint; bone hide-grainers, finished and unfinished—the entire lot comparing favorably

with the objects from Work A. A second cache, five feet northeast of the first, was empty with the exception of animal bones and a quantity of fish spines and scales. The bottom of each cache was eight feet from the surface and four feet below the floor of the house. At the time frost stopped further work six caches had been found in this ruin.

A mile still farther south, and beyond a deep valley which cuts the north-south ridges, a large number of earth-lodge ruins are found, associated with scores of mounds more pronounced than any others of the neighborhood. None of these has been explored. Excavation in two shallow house ruins proved them to be of other origin than those described. No stone implements, sherds, or caches were found. Nearly the entire surface of a bench covering possibly five acres¹ is pitted with excavations from two to six feet deep. These holes were made by relic-hunters. Inquiry as to their origin elicited the information that they were made by a regiment of United States Infantry which, twenty years ago, was encamped near there during rifle practice. The soldiers had explored the old "burying ground" for "relics," consisting mostly of old Spanish coins dating back to the Fourteenth Century, with copper pots and other utensils. Although the writer has never seen any of these "relics," former members of the regiment camped near the burial ground, now living in Omaha, have informed him that the coins were so plentiful that the soldiers used them for poker-chips.

The writer is satisfied that the graves containing the copper "relics" were not those of the Omaha tribe, as is generally supposed, but probably of the Oto, and that the village, described by early explorers as having been long abandoned when they saw its ruins, occupied the bench which undoubtedly extended over many acres before cut away by the Missouri, which is doing the same thing every spring today, near where these graves were situated. This cemetery occupies the northern extension of a river bench a mile north of the railroad station at Bellevue. Between the two points I have found flint implements and have seen the remains of

¹ This bench must have been considerably larger prior to the encroachment of the Missouri river and the grade of the Burlington Railway skirting the foot of the present line of bluffs one hundred and fifty feet lower down than the two last ruins mentioned, and fifty feet above the river level.

lodge-fires where erosion has cut the surface. All evidence tends to place the arrival and occupancy of the Oto in the area described as much more recent than the people who occupied only the highest ridges of the same neighborhood and who buried their dead beside their homes.



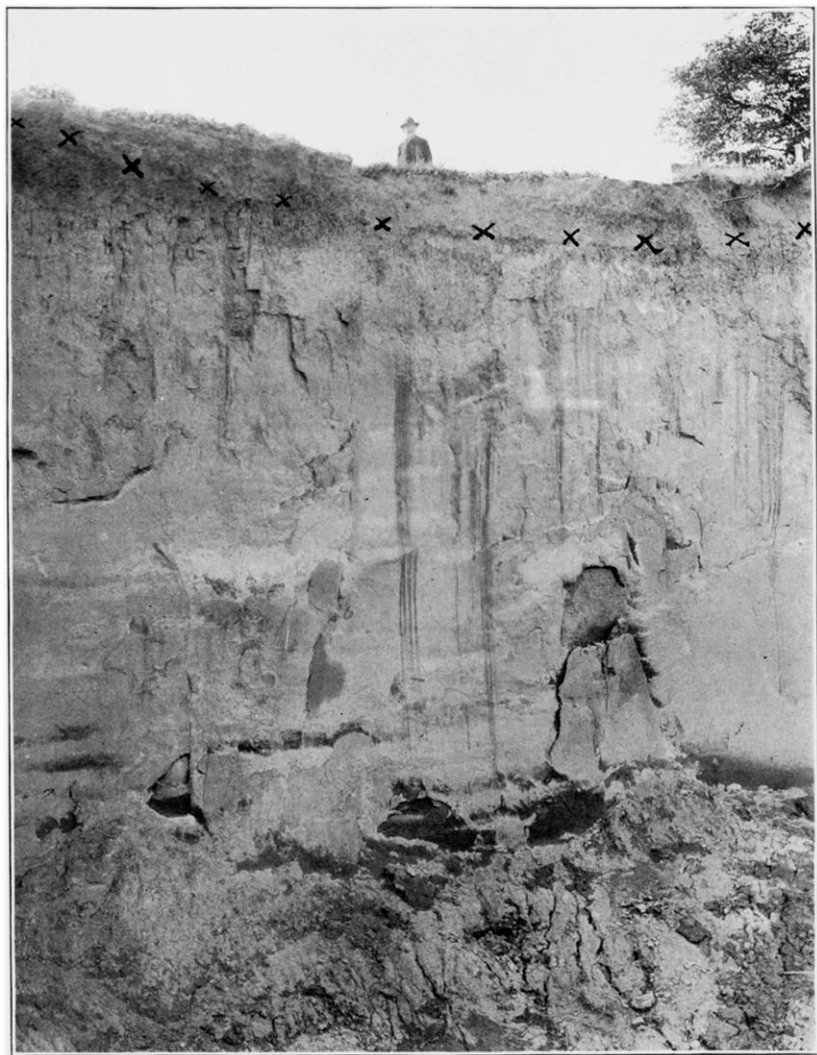
FIG. 5. — Excavating in ruins at 17th and P streets, South Omaha, Nebraska.

North of Childs Point one fails to find house ruins until well within the limits of the city of South Omaha, in Douglas county. Whether long cultivation of the soil has obliterated the ruins cannot be determined. Tumuli, however, occur almost at intervals of a hundred yards the entire distance between Childs Point and the city of Omaha. Two miles north and west of Work A, at about what would be the junction of Seventeenth and P streets (fig. 5), South Omaha, surrounded on three sides by city residences, are four house ruins situated on the summit of a hill that has been used by boys of the vicinity as a baseball ground. Within the field is a large ruin which the players have partly filled with earth. The depression still retains water, and when first seen by the writer ducks

were swimming in it. A hundred yards to the east of this ruin are two others, one of which was explored by Mr J. E. Wallace, one of my associates. A cache was found ten feet west of the center, the bottom of which was seven feet from the surface of the ground. It contained very finely made and polished bone implements, and sherds of a very poor quality of pottery, some of which appear as if they had been exposed to the elements before being covered in the ruins. Other sherds were well burned. An object of much interest consists of the fragments of about three quarters of an unburned pot about the size of a teacup.

A few days after work was begun, the writer and his associates commenced extensive exploration of the ruin. Three feet north of the first cache was another, of the same depth as the first. It contained several beautifully made projectile-points and knives made from agate and jasper recognizable as material from the "Spanish diggings" of Wyoming; a bone fish-hook, four inches long, slightly curved, and tempered and polished; a small bone object, not thicker than the lead in an ordinary pencil, about an inch long, sharpened at one end and with two incised lines encircling the opposite end; many scrapers of ordinary form; a bone pendant, or bracelet, an inch by three inches in rectangular dimensions, partly curved, drilled through at each corner of one end, and shaved down to the twenty-second of an inch; lumps of potters' clay mixed with powdered granite, others mixed with lime and volcanic ash. On a narrow ledge a foot above the bottom of the cache was a crude pottery head, representing a person of low forehead and with prominent nose. Pieces of quartz and drift spalls lay near the bottom, in the earth filling the cache and on the house floor. A fine chipped flint celt, and ungrooved hammerstones of the commoner kind, pitted on one side, were also found. In all some two hundred objects were recovered, which, with the exception of some of the pottery, compare favorably with the objects from Work A at Childs Point. Several pieces of red hematite, yellow ocher, and pumice were also found in the ruin.

Near the junction of Poppleton avenue and Twenty-fourth street, Omaha, surrounded on all sides by city residences, are four circular house ruins. A brick-making plant, using loess in its man-



The crosses show the line of the lodge floor and the face of the loess section discolored by rain washing the charcoal on the floor.

EARTH-LODGE RUIN IN OMAHA, NEBRASKA

ufacture, has cut through the eastern third of the largest ruin, and its floor shows as a saucer-shaped line of charcoal and dark earth. The vertical step or platform noted in Work A, Childs Point, is wanting. Exploration has shown flint implements and chips, together with potsherds with a binder and appearance differing from any others of this section. The ruins are shallower than many others noted, and occur but half-way to the summit of a high hill (pl. 11).

Half a mile nearer the river bluffs than the four ruins mentioned, on a hill overlooking the river valley and surrounded by homes of Omaha residents, graders have exposed a section of an earth-lodge ruin. The floor is four and a half feet from the surface. The bases of the outer row of posts, burned to charcoal, are exposed and show the wood to have been oak. Implements and sherds identical with those from Childs Point and South Omaha have been found there by my associates.

The surface of an ancient earth-lodge ruin of the kind explored by the writer naturally drains moisture toward its center. Even after heavy rains of a week or more, away from the center the earth near the floor is dry and extremely compact. All the ruins explored are situated on high ridges, with deep valleys between, thus assuring good drainage and explaining why bones are found in good condition, although probably of considerable age.

Today there remain of the forest primeval which covered Childs Point many large oak and walnut trees, some of which are three to four feet in diameter. The other timber is mostly of second growth. One of the oaks, six feet nine inches in circumference, grows from the rim of an earth-lodge ruin. With primitive picks of antler, bone hoes, and stone axes, could it have been possible for the Indian to excavate great holes in the ground, eight to fourteen feet in depth and ninety feet in diameter, if forest trees had covered the ridges at the time the lodges were erected? The explorer with modern steel tools today finds it difficult to excavate in moved earth interlaced with masses of great roots and containing tree-stumps, and he has therefore come to the same conclusion he reached in the exploration of the Ponca Creek district, namely, that at the time these dwellings were erected the ridges were bare of timber and an extensive view could be had from their summits.

The vegetal mold covering the ruins is partially composed of wind-blown sand from the river bars, and it seems probable that the hills were formed in the same manner. Whatever deduction is made concerning the possible age of these dwellings must take into consideration the eighteen to twenty-four inches of vegetal mold, which, where trees and grasses are exposed to fire, and where even at this day the forest is sometimes ravaged by flames, must necessarily be of slow formation. The problem is one of geology; and without positive knowledge of what people erected these lodges, geology must approximate the time which must have elapsed while the vegetal mold was forming.

The circular ruins similar to those explored by the writer are seldom found far from the rugged hills bordering the Missouri river, the highway connecting the warmer regions of the south and the north Pacific coast. They seem to have been erected with little attempt at tribal formation, and vary in size from thirty to ninety feet in diameter and from one to nine feet in depth at the center at this day, the floor being four to five feet lower. The larger ruins in the Childs Point district average five to six feet deep on the present surface. A feature of the largest ruins is a graded entrance, opening to the south, from thirty to fifty feet in length and paralleled on each side by small ridges of earth sometimes three feet high but becoming lower at the farthest point from the house ruin. It is probable that these long entrances were covered with the same material and in like manner as the lodge. The average ruin, including Work A, has two entrances, one at the south and the other at the east. In Work A it was noted that the step, or platform, ceased in front of the entrances to the extent of the distance between two of the outer posts.

In summing up the results of exploration of the earth-lodge ruins in this section of the Missouri valley it must be noted that there is more than one kind of aboriginal habitation in a given area. One probably antedates the invasion of white people, while the other appears to have existed at the time of the coming of the whites. Whoever the builders of these ancient habitations may have been, it seems reasonable to credit them with the construction of a style of dwelling which was probably cool in summer and

warm in winter, able to withstand the tornadoes which even at the present day are too numerous and too severe for comfort, as the writer experienced during his spring work. It also seems reasonable to give these aboriginal builders the credit of being the originators of the celebrated Nebraska sod-house.

IMPLEMENTS, UTENSILS, AND ORNAMENTS

Stone Objects. — No spear-points have been found in any of the ruins explored by me or my associates, but arrowpoints, both with and without notches, are plentiful. Both types are generally well formed. They are usually found about the outer circle of the roof supports and in the caches.

Scrapers show the usual forms, but those of the longer-than-broad type prevail.

Cutting edges, showing one or more blades, appear to have been made of odds and ends of flint formed from rejects and of chips left from working other implements.

Diamond-shaped flint knives are numerous. These have four cutting blades and are well made (pl. I, I, *d*).

In at least two ruins small caches or deposits of flint had been laid in some order, the smaller pieces below covered by larger pieces as if for safe-keeping and where they could be found when occasion required for making into implements.

Two ground celts only were found; five others were of chipped flint (fig. 6, *b*). One of the former, finely made and still retaining a good cutting edge, is of diorite (fig. 6, *a*), the other is of granite. The latter appears to be very old and much weathered, probably from exposure to the elements before being covered by the house ruin. It lay nearly at what had been the top of the roof.



FIG. 6. — (*a*) Polished diorite and (*b*) chipped flint celts.

Many arrowshaft smoothers of yellowish Dakota sandstone were found. In all the ruins explored there were found, in addition, rectangular pieces of sandstone which seem to have been used for much the same purpose as sandpaper. The same kind of stone shows that it had probably been used for pointing implements, possibly bone awls or punches, being grooved in many directions.

Coarse red and gray pumice, which floats down the Missouri from well up in North Dakota, found in all the ruins and tumuli, also shows surfaces which suggest use as smoothing stones.

Calcined granitic rock, pink Sioux quartzite, and round drift pebbles the size of one's fist and smaller, all of which show marks of fire, are found in numbers on the floor surface and in all caches. The latter may have been used in heating water.

Shell Objects. — One small oblong piece of shell, worked down to shape, shows deeply incised lines following its longest diameter (pl. III, 1, *l*), while others have notches on the outer edge (pl. III, 1, *b, j*).

A rectangular piece of shell, with holes drilled in two corners.

A fish cut from a heavy *Unio* is carved in excellent form, with square tail and three fins. A hole drilled through the back from both sides suggests use as a pendant (pl. III, 1, *g*).

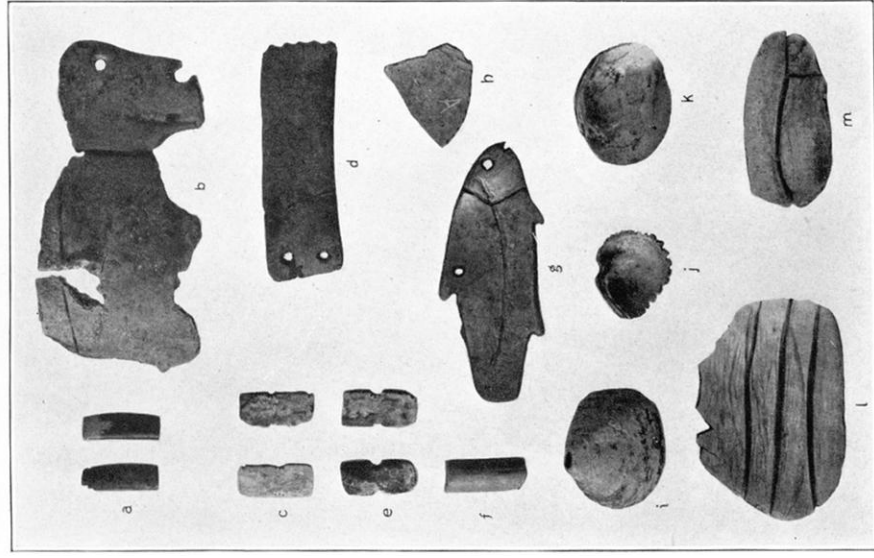
One scraper-shaped shell was found; its use is problematical.

More than a score of shell spoons(?), with edges beveled at right angles to the grain of the shell, were found; and small *Unios* show a slot cut through at the hinge (pl. III, 1, *i, k*).

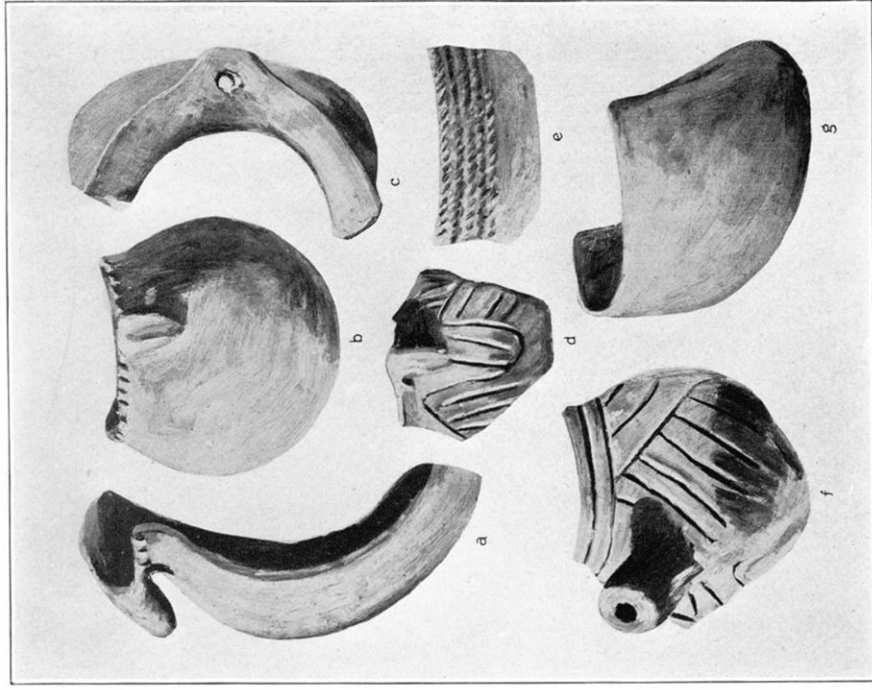
Pottery. — A large part of the pottery found in the caches and through the ruins is of excellent ware. No whole pot was found. In some instances the rims of two or more pots were found together in a pile. Much of the pottery was unearthed near what had been the roof of the lodge — as if it lay on the roof when the house fell in. Most of the vessels must have been provided with stout lugs, both ornamented and plain (pl. III, 2).

In many of the ruins balls of unbaked clay mixed with granitic binder, and others mixed with lime and sometimes with volcanic ash, were found. These, when not in caches, occurred near the remains of small fireplaces on the house floor.

Several small pots, some of which have been used as pain



1. *a*, Beaver-tooth pendants; *b*, Bone anklet; *c*, *e*, Shell pendants; *d*, Section of bone bracelet (?); *f*, Bone bead; *g*, *h*, *i*, *j*, *k*, *l*, *m*, Shell ornaments and pendants.



2. Potsherds from cache pits.

receptacles, their inner surfaces being still thickly coated with vermilion or Indian red, were found almost entire. The color is easily rubbed off when moistened. Small pieces of undecorated rims and sherds, never large pieces, show a fine ware burned to a deep orange-red. The color runs entirely through the pottery. It was not met with in all the ruins, but was found in most of those explored on and near Childs Point. The commoner pottery shows a dull reddish exterior surface, while the interior is of light or dark bluish-gray.

Pottery Pipes. — In all, seven pottery pipes were recovered, five of them nearly perfect. A pipe from Work A is in the form of a soaring bird, feathers being represented by incised lines across both sides of the wings, at oblique angles to the body. The breast is well modeled, and the mouthpiece forms the tail of the bird. It is likely a bird's head was attached to the pipe, as the outer or front side of the neck shows a fractured edge (pl. v, 2, *b*). Another pipe is somewhat on the "monitor" model, while two other broken pipes indicate two of the latter sort (pl. v, 2, *a*).

Objects of Bone and Antler.

— Complete hoes and fragments formed from the scapulæ of bison, elk, and smaller animals, were of frequent occurrence throughout the ruins explored. The working edge of the blade is beveled and highly polished. Twenty perfect hoes were gathered. Implements formed from small scapulæ were probably used in pottery making; these show a beveled edge reaching to the socket end of the bone and indicate much use. The



FIG. 7. — Bone hoes.

supposition is that these bone hoes had been hafted, but occasionally one is found which shows a remarkable polish, as if produced by hand abrasion, throughout its length. Near the sharpened

edge of most of the larger hoes one or two notches have been cut (fig. 7, *a*); these show a wear and polish as if once bound with a thong or cord. One has a small hole drilled through one side opposite a notch on the other side (fig. 7, *b*).

Punches or awls were of frequent occurrence. These are symmetrically formed and highly polished (pl. IV, 1, *i-n*).

Bodkins show a hole at the larger end similar to the steel bodkins in use by whites today. They are skilfully formed and are very thin.

Needles are small in diameter, long and tapering, and still quite sharp (pl. IV, 2, *a-h, o-q*).

A pendant, or perhaps a bracelet, made from a bone worked down to about the twenty-second of an inch in thickness, is rectangular in shape, one by three inches, and has a drilled hole in each corner of one end (pl. III, 1, *d*). It is slightly curved.

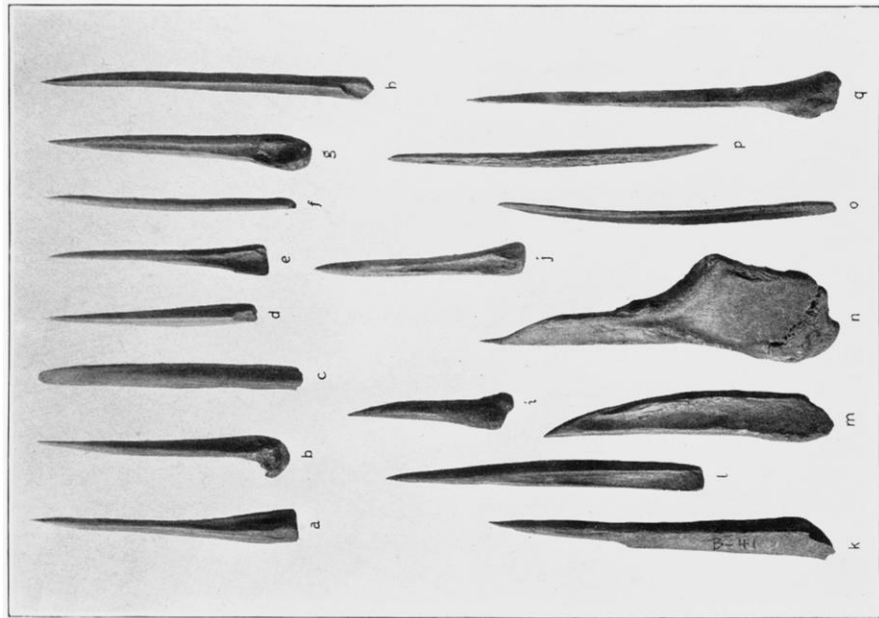
Five fish-hooks were found. One of these is made from a small pointed bone, about four inches long, with one end slightly curved; another is a well-formed plain hook, while the other three are splendidly made and notched on their outer elbow (pl. 1, 2, *a-e*).

Five antelope jaws show much use, each having a higher polish than any other of the bone implements. They have been evenly cut and pointed an inch in front of the premolars. Each shows two grooves on the inner surface, which seem to have been made by a thong, suggesting the fastening of a handle on the outer side of the jaw or its envelope by some sort of covering used probably as a handle and lashed in place. Small splinters chipped from the pointed end suggest use in flaking flint implements. All have seen much service. They have been evenly tempered by fire and are still firm in texture (pl. IV, 2, *b, d*).

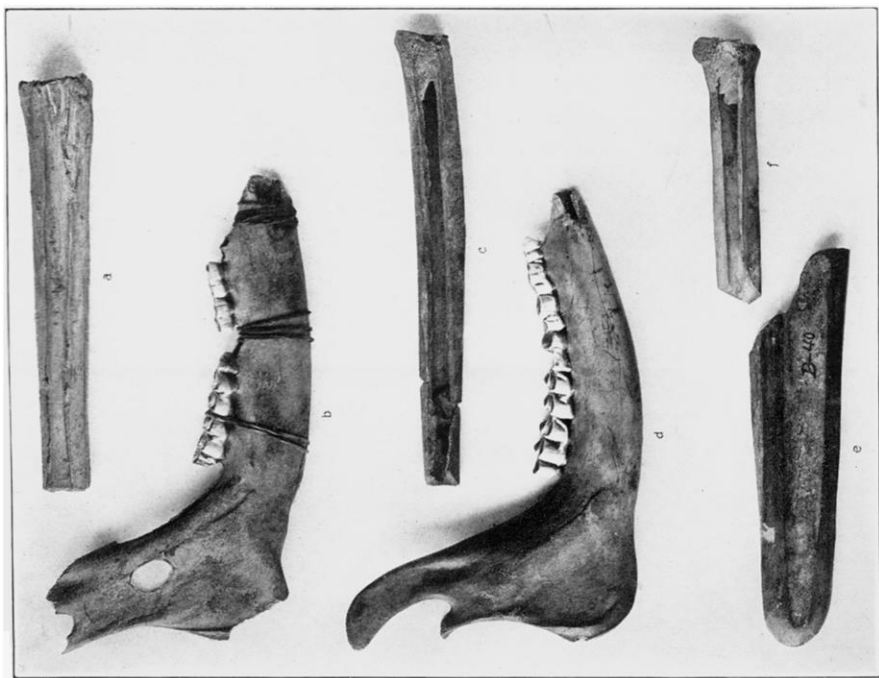
One so-called bone buckle was found (pl. 1, 2, *f*).

Deer antlers with side prongs cut away suggest use as picks.

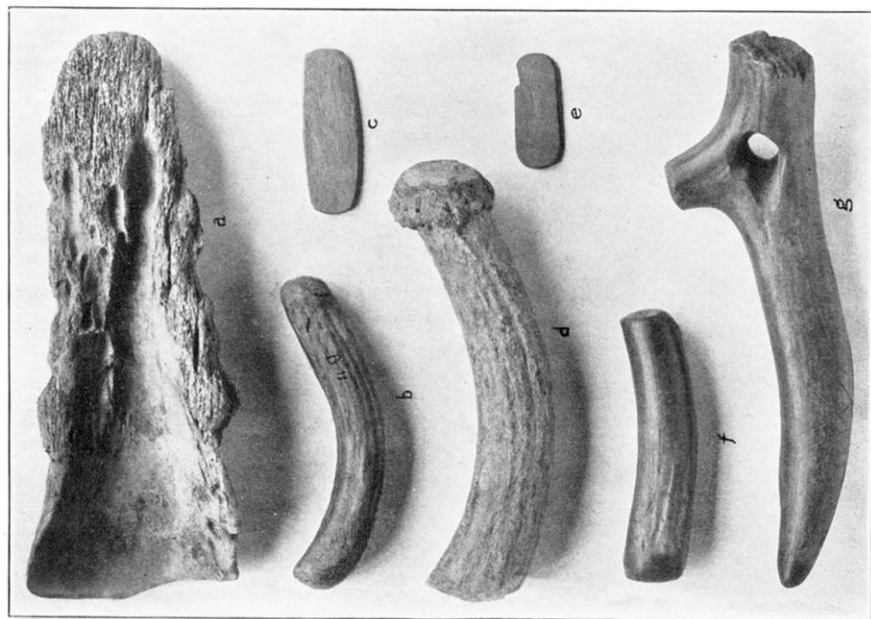
Gouges and grainers were of frequent occurrence. One of the latter shows much use (pl. IV, 2, *c*). Another, made from a similar bone, shows deep incised lines from one end to the other, as if the artisan had commenced to form a grainer; yet it is possible that the pieces intended to be cut out were designed to be worked into needles or other small implements (pl. IV, 2, *a*).



1. Needles and punches.

2. *a, c*, Grainers; *b, d*, Antelope mandibles, of unknown use; *e, f*, Undetermined objects.

BONE OBJECTS



1.—a. Bison horn spoon (2); b, c. "Flint flakers"; d. Haft for flint knife (pl. 1, 1 d) found with blade inserted in slotted haft; e, f. Bone objects; g. Arrow-shaft straightener.



2.—a, c, Pottery heads; b, d, e, f, g, Pottery pipes.

Bird and coyote bones were numerous in food caches, and fish spines, scales, and vertebræ were likewise common. Other animal bones and skulls found in house ruins have been identified as those of the bison, elk, mule-deer, antelope, squirrel, pocket gopher, and turtle. The skull and bill-core of a member of the heron family were also found.

Objects made from pieces of deer antler, with smoothed and polished surfaces and beveled ends, are of unknown use (see Post-script). Fourteen of these have been found (pl. v, 1, *b, f*). They suggest a short handle of some kind, but are neither notched nor grooved.

Another antler object shows skilful workmanship, but its use is not known (pl. 1, 2, *i*).

Still another, six inches in length, is artificially slotted at one end. Two small holes are drilled in two opposite sides, close to one end, and the part between split open, suggesting a haft possibly for small flint blades or cutting edges.

Two objects of antler, hacked and cut by rodents and possibly also with flint blades, might be hafts of some kind.

Pieces of scapulæ, polished to a high degree, may have been used as scrapers. An inch of the surface shows a polish, and it seems likely that the other portion was once covered with something like a piece of dressed hide to protect the hand of the user.

All bone and antler implements show hardening or tempering by fire, marks of which cover portions of their surfaces. Whenever bones other than those which show this tempering were found, or unless encountered well down in cache pits, they were greatly deteriorated.

Caches. — Caches were not built on a uniform plan. Some were slightly funnel-shaped, with the smaller end uppermost (fig. 2, *b*), but most of them were sunk into the earth at such an angle that the cache proper was just beneath the step or inner edge of the platform (fig. 2, *c*). The cache with its entrance was found to be two and a half to three feet deep, and either plastered or rammed, as the walls are still very hard. All the caches were filled with earth other than that in which they were excavated, and in almost every instance ashes covered the entrance in the floor. Sometimes charred grass

or reeds indicated a mat-covering. When a cache was located, a deep excavation was made at one side, and the contents thereby exposed in vertical section. The line of earth filling the caches and that of the hill was always strongly marked. Many of the caches were supplied with shelves, or niches, on which often rested the more valued objects (pl. vi).

In one cache a ball of finely grained clay mixed with beeswax was found. Its use is not known.

There were no evidences whatsoever that horses had been used by the house builders.

Sculpture. — Among the objects found in the earth-lodge ruins in the Childs Point district, and in similar earthworks two miles northward in Douglas county, are three sculptures representing human heads. One, from Work A, is of pink soapstone with what may be termed Oriental features. The eyes, made with incised lines, are "almond shaped," with closed lids; the nose is long and flat, and somewhat negroid; the lips are separated, the cheeks and chin are well rounded, and the forehead is high and broad, in good proportion to the remainder of the face. Two square "tabs" take the place of ears, and are similar to those on Egyptian reliefs and outlines. The object bears resemblance to the bowl of a small pipe. Its height is one inch, the diameter half an inch. Two posterior openings show finished edges; one is too small to admit a stem, while the other is rather too large. The interior of the bowl, which has been hollowed out with rude tools, shows no discoloration. An incised line encircles the top near the rim. For whatever purpose the object was designed, it has been carved with great delicacy. The face, which appears to represent that of a sleeping person, is decidedly feminine (pl. 1, 1, a).

Another representation of a human head, showing decidedly masculine features, is made of a poorly burned, reddish-yellow clay with a very coarse binder. A prominent nose, the base of which springs from a low, retreating forehead, is of Indian type, but appears to be a caricature. The mouth is broad, and the chin strong and rather prominent. The eyes are represented by small lumps of clay, raised from the face an eighth of an inch, across which slits show the meeting of the lids. Small squarish pieces represent ears.



CACHE UNDER FLOOR OF EARTH LODGE

The throat is heavy and strong. The whole figure is exceedingly crude (pl. v, 2, c).

The third head differs materially from the other two. It is of the same material of which the better sort of pottery is made, and has been burned very hard. With the exception of the flattened posterior, the head exhibits little of any recognized Indian type. The face represents a person laughing, with mouth widely extended and eyes partly closed. The forehead is high and broad, the eyes well modeled and with brows slightly lifted, the nose somewhat aquiline, mouth firm, and chin well rounded. Instead of ears of one piece, three small raised squarish bits of clay, one above the other, give the impression at once of sparse side-whiskers. Examination shows that these were originally one piece, but that they were cut after the head was fired (pl. v, 2, a).

OMAHA EARTH-LODGE RUINS

During progress of the work in the Childs Point ruins I digressed long enough to spend part of a day on the farm of Amos Gates. It was here the Omaha lived last before going on a reservation, and where they were visited by the Swiss artist, Kurz. Some of the Kurz sketches, reproduced by Mr Bushnell in the January-March, 1908, issue of the *American Anthropologist*, show outlines of earth-lodges that were sketched on the Gates site at the time. I was anxious to compare the ruins of Omaha lodges with those in which I was working nearer the river. It was found that the ruins were quite shallow and had left but slight depressions, while others left small circular mounds above the surrounding level. The Rock Island Railroad has cut through the village, and at least one cache was exposed from top to bottom—about fifteen feet. In all instances the caches were outside the lodge sites.

The surface yielded fractured iron pots, Delft or figured china of white man's manufacture, and rusty iron objects, besides flint scrapers and chips, potsherds, and the usual accumulations of a village prior to contact with white people. The writer cannot attribute the flint implements to the Omaha, but considers the favorable site on a plateau at the junction of two streams to have been used by another people long before the Omaha erected their lodges there.

EXCAVATIONS BELOW CHILDS POINT

In the early part of April, 1908, not far from the south property line of the owner of Childs Point, Sarpy county, Nebraska, while ascending a steep ridge parallel to the Missouri river-bottoms, Mr J. E. Wallace, of Omaha, one of the writer's associates in archeological research, chanced upon human bones on the surface of the ground. He excavated near where the bones lay, finding a burial consisting of a very slight elevation on the ridge, two-thirds the distance to its summit. The mound was about forty feet long by fifteen to twenty feet broad. Operations at the southern or highest end of the mound resulted in unearthing ten skulls and a number of skeletal parts.

A few days later the writer assisted in the work and continued until forty crania had been obtained.

Our first work began in the northern or lowest end of the mound, where a rectangular excavation, four by five feet, was made. Fourteen inches from the surface a stratum of skulls and bones, including six of the former, was exposed. The skulls lay with crowns uppermost and faces to the northward. Between and on each side were piles or, more properly, bundles of the longer skeletal parts.

On removing the bones it was observed that many dissociated and fractured calcined bones lay scattered throughout the mound. Some of these calcined bones were as white as chalk, but firm in texture. The parts of the calcined skulls rang like glass when struck with a piece of steel. The action of fire was not noticed on skulls and bones which lay in actual contact with those that had been burned. All the entire skulls were rather soft when first removed, but hardened rapidly on exposure to sun and air. Some were filled with packed earth, while others, on the same level, were almost empty. One of them contained the nest of a field-mouse.

Eighteen inches below the first layer another stratum was found, in character much like the first—crowns uppermost and faces to the north, flanked on each side with long-bones. The calcined bones were as much in evidence in the second layer as in the first. Occasional bits of charcoal were encountered at all levels, as well as some baked loess, but there had not been sufficient fire used in the sepulcher to calcine the bones, and it is evident they had been subjected to heat prior to interment.

On the last day the excavation was enlarged, and a third stratum of skulls was found beneath the others. These lay without order, intermingled with skeletal parts. Thirty-nine skulls and many skeletal parts were taken from the mound.

Another skull, in pieces, was obtained by the writer several weeks later during a field meeting of the Nebraska Ornithological Union in the mound's vicinity. It was peculiarly marked by an incised line extending across the frontal and both temporal bones, and is among a number sent to Dr Hrdlička for examination.¹

Potsherds and flint scrapers, pumice, pieces of red hematite, and quartzite spalls, similar in every respect to objects found in Work A and other nearby ruins, were found with these remains, showing relationship between some of the skeletons and those of the occupants of the earth lodges described in this paper as surrounding the Wallace mound on three sides.

POSTSCRIPT

Two features bearing on the subjects discussed in this paper have been noted subsequently and are here given because of their connection with the subject matter treated.

In the latter part of October, 1908, while graders were leveling a loess-capped hill at the junction of Thirteenth and I streets, South Omaha, Messrs Wallace and Hughes found there three greatly fractured human crania and the tibia of a skeleton associated with several mortuary objects. The best preserved of the skull fragments show a moderately thick cranial wall, somewhat heavy supraorbital ridges (although not heavier than occasionally found among Indians), and an exceedingly flat forehead without frontal eminences. The site is well drained, and the bones lay under a mound so low that it could not be noted owing to the dense growth of shrubbery that covered the hill. The hill extends along the edge of the river-bottom and is about one hundred feet higher than the water level.

My two associates and the graders observed, two and a half feet from the surface of the hill, ten or twelve bright reddish spots in the loess, in three of which were the three broken skulls. These red-

¹ See specimen No. 251,894 in the accompanying description by Dr Hrdlička.

dish spots I found on examination to be loess burned to the consistency of soft brick, through which small flakes and pieces of red hematite were profusely scattered. When the plow passed through one of these red spots, so thickly was the color spread over its surface that the metal and wood were colored a bright vermilion.

The mortuary objects found with the skulls consist of two gorgets, one of slate (pl. I, I, *c*), the other (the larger) of mica schist (pl. I, I, *e*). Each gorget lay just above a skull and immediately over their orbital cavities.

Other objects with the remains were a small chert blade, several objects made from the anterior side of beaver-teeth (pl. III, I, *a*), and a dozen finely made rectangular objects of shell, slightly notched at one end and each with three notches on each side (pl. III, I, *c*, *e*). All the objects, with the exception of the chert blade, differ from anything hitherto found in this section.

Excavations in various parts of the same hill showed small pieces of human bones, but no skulls.

Five hundred yards directly west of the spot yielding the skulls, a house ruin of the kind hitherto described produced objects similar to those of Childs Point, among which was an incisor of a beaver, showing colors similar to the objects found with the skulls.

The second feature relates to the excavation of a house ruin south of the property line of Childs Point, from which were taken hundreds of fine implements cached nine feet beneath the surface. The cache had been filled with more than two cubic yards of ashes, through which implements were scattered. One of the objects was a crude spoon (?) of buffalo-horn, the bowl being a portion of the skull of the animal (pl. V, I, *a*), and an object of antler, probably used for straightening arrowshafts (pl. V, I, *g*).

On the eastern side of the ruin, five feet from the surface, I noted a vertical step similar to that found in Work A. About the floor, covering perhaps a square yard, were scattered a peck of small flint flakes and chips, and lying with them was the implement with which the primitive artisan probably had been working — a short smooth piece of antler showing a high polish, similar to the antler objects found in a spring in Oklahoma and which Prof. W. H. Holmes sug-

gests might have been used for flaking flint implements by percussion (pl. v, 1, *b, f*).¹

Other objects found in these ruins were many large flattened pieces of baked clay, one surface showing an impression like the grain of split wood, the opposite showing the imprint of small twigs and leaves. These were found within the ruin, not far from the rim about which the outer row of posts were placed. These specimens substantiate a conclusion based on a similar discovery, made earlier in the year, pointing to the use of a plaster of clay in some part of the house construction and which became baked when the house was destroyed by fire.

Five feet south of the point where the primitive artisan sat chipping his flint implements, I found another cache, the bottom of which was twelve feet from the present surface and about eight feet from the surface of the lodge floor. A sherd nearly a foot long by eight inches wide; a small mortar made of a drift pebble, two inches deep by three inches in diameter, showing a very slight "dish," and a charred corncob, were found. The cob, which was scarcely three inches in length by three quarters of an inch in diameter, shows that the grains were not larger than those of our popcorn, and had twelve rows of kernels.

The filling of the cache consisted of alternate layers of gray ash and the usual cache "dust" to within three feet of the bottom; above that occurred surface earth — a mixture of rather dark and light soil — then clay, probably placed in the opening and tamped while wet, the line of demarcation between it and the surrounding loess being very plainly marked.

OMAHA, NEBRASKA.

REPORT ON THE SKELETAL REMAINS

By ALEŠ HRDLÍČKA

The collection of human bones presented to the National Museum by Mr Gilder consists of two small lots, all in a more or less imperfect condition. There are in all six skulls, several long-bones, and two pieces of a skull which show the effect of cremation.

¹ Flint Implements and Fossil Remains, *Annual Report Smithsonian Institution*, 1901, p. 247, pl. 24, 25.

None of the specimens bears evidence of great antiquity, and one of the skulls appears to be quite recent. All show well-defined characteristics of the Indian race. They present but few lesions, and no sign of syphilis or tuberculosis.

Two of the skulls are flattened posteriorly, the result of cradle-board pressure. Of the non-deformed skulls, one is strictly dolichocephalic, while three show typical brachycephaly. These conditions indicate the presence of at least two, and possibly three distinct tribes of Indians.

The dolichocephalic skull represents people of the type of the majority of the Plains Indians and of the Algonquians, while the brachycephalic crania connect more immediately with those of the same type in Iowa, and remotely with the round-head people of the South Central and Gulf states.

The individual specimens may be described as follows:

Catalogue No. 251,893. — A defective skull, found buried in the earth taken from one of the circular earth-lodge ruins. The frontal parts are missing. The cranium is plainly that of an adult male, and shows no deformity. It is of fair size, of ordinary thickness (left parietal above the squamous suture 5–7 mm.), and brachycephalic in form. The ridges and processes indicate strong but not excessive musculature. The left mastoid shows an old perforation, the nature of which is not clearly discernible. The upper jaw presents alveolar prognathism and deep canine fossæ. The lower jaw is strong; height at symphysis 3.4 cm. The teeth are of moderate size and without abnormality in number or form; they are worn off to about two-thirds of their height above the alveoli.

With this skull was found a piece of an adult femur; it shows moderate strength and pronounced platymery (3.4×2.25 cm. at the broadest part of the flattening).

Catalogue Nos. 251,889, 251,890. — These two crania, which were marked respectively *A* and *B* by the collector, are from a mound near Bellevue, Nebraska. No. 251,889, the darker specimen, is from a superficial position, having been found about eighteen inches from the surface; while the lighter skull, No. 251,890, is from the lowest level of the mound. Both specimens are damaged, the former lacking all parts of the face, the latter, parts of the posterior facial structure.

No. 251,889 is apparently a male skull, though there remains some doubt as to the sex; it is symmetric, in no way deformed, quite heavy, and brachycephalic. No. 251,890, plainly the skull of a female, is light, and shows marked occipital flattening, on account of which its normal shape cannot be positively determined.

Neither of the specimens shows any important anomaly or other

special features. The principal determinations and measurements are as follows:

	251,889	251,890
Approximate age	50	25
Diameter antero-posterior	17.1 cm.	(15.0 cm.)
Diameter lateral maximum	14.3 cm.	(13.6 cm.)
Basion-bregma height	12.9 cm.	(12.7 cm.)
<i>Cranial index</i>	83.6 cm.	?
<i>Height-length index</i>	75.4 cm.	?
<i>Height-breadth index</i>	90.2 cm.	?
Cranial module	14.77 cm.	13.77 cm.
Capacity	1245 cc.	1080 cc.
Thickness of left parietal above		
squamous suture	5-6 mm.	4-5 mm.
Menton-nasion height	?	10.3 cm.
Alveolar point-nasion height	?	6.0 cm.
Basion-alveolar point length	?	about 10.0 cm.
Basion-nasion length	10.1 cm.	8.9 cm.
Diameter frontal minimum	9.7 cm.	8.7 cm.
Lower Jaw : Diameter bigonial	?	8.9 cm.
Angle, mean	?	125°
Height of symphysis	?	2.95 cm.
Orbits, height, right	?	3.4 cm.
Orbits, breadth, right	?	3.9 cm.
Nose, height	?	4.4 cm.
Nose, breadth	?	2.4 cm.
Palate, external length (Turner)	?	5.3 cm.
Palate, external breadth (Turner)	?	6.4 cm.
Foramen magnum, mean diameter	3.0 cm.	3.0 cm.
Circumference, maximum above		
ridges	49.0 cm.	45.8 cm.
Arc nasion-opisthion	34.3 cm.	33.2 cm.

Catalogue No. 251,891. — This skull was found by Mr Harry Jewell, of Omaha, in a mound, approximately three feet high and eighty feet in diameter, about two miles from the Council Bluff of Lewis and Clark, in Washington county, and some six miles north of the "Gilder" mound. There were parts of several skeletons, flint chips, and a piece of rubbed sandstone.

This cranium is that of a male of about fifty-five years of age. It is well developed, shows no deformation, nor any lesion except accidental breaks, and is decidedly brachycephalic, in type much like skull No.

251,889 from the mound near Bellevue. Unfortunately the facial parts have been lost, but the lower jaw remains. The few measurements which the specimen yields are as follows :

Diameter antero-posterior	about 18.0 cm.
Diameter lateral maximum	15.7 cm.
Height	Medium
Capacity	Fair
Thickness of left parietal above squamous suture	5-7 mm.
Circumference maximum above ridges, approximately	53.5 cm.
Lower jaw : Diameter bigonial	9.7 cm.
Height of symphysis	about 4.0 cm.
Angle	near 115°

Catalogue Nos. 251,892 and 251,894. — Two skulls from the Wallace mound, Sarpy county, Nebraska. Skull 251,892 is that of an aged female, and shows pronounced occipital flattening or cradle-board compression. No. 251,894 is the skull of a young adult male, with a slightly asymmetrical occiput, but without flattening. The form of No. 251,892 cannot be determined on account of the flattening; No. 251,894 is brachycephalic.

Cranium No. 251,892 seems to be comparatively recent, more so than the other skull from the same mound. Judging from the supra-orbital ridges, mastoids, and styloids, all of which are somewhat more developed than in the average female, it belonged to a woman accustomed to considerable muscular labor. The face shows quite marked alveolar prognathism and canine fossæ, the depth of which is accentuated by senile sinking in. The sutures, as in all the specimens of the Gilder collection, show sub-medium serration and but few Wormians. The specimen presents no artefacts or disease. Its measurements are :

Diameter antero-posterior	(15.5 cm.)
Diameter lateral maximum	(15.0 ")
Basion-bregma height	(13.8 ")
Thickness of left parietal above squamous suture	5-6 mm.
Diameter bizygomatic maximum	13.8 cm.
Basion-nasion length	9.8 "
Diameter frontal minimum	9.1 "
Height of nose	5.25 "
Diameter of foramen magnum	3.3 "
Circumference maximum above ridges	48.4 "
Arc nasion-opisthion	33.7 "

Specimen 251,894 is in pieces, and unfortunately some important parts which would have made possible its reconstruction are missing.

The skull was apparently one of normal development and is that of a male of only moderate musculature. The only measurements possible are :

Thickness of left parietal above squamous suture	5-6 mm.
Diameter frontal minimum	9.0 cm.
Mean diameter of foramen magnum	3.3 "
Lower jaw :	
Height of symphysis	3.4 cm.
Angle	127°

The skull presents interesting and extensive artefacts of a peculiar nature. Over the frontal, parietal, and part of the occipital are connected and to some extent symmetric, irregular grooves, which appear as if made with a coarse implement such as a stone axe, or a large stone knife. They

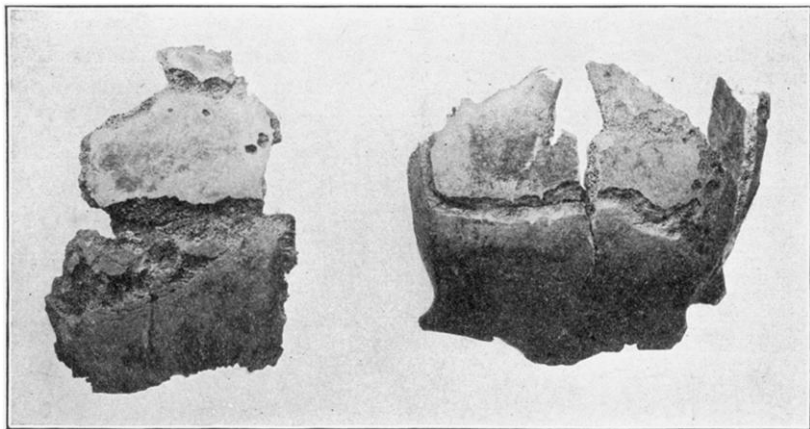


FIG. 8.—Skull from the Wallace Mound.

are from two to four millimeters deep, and range from six to more than twenty millimeters in breadth. They present clean though irregular and grossly serrated edges in the outer compact layer of the bone in the front, but become more diffuse in the back, particularly over the posterior part of the right parietal and on the right half of the occipital squama. They reach well into the cancellous tissue, and in places, particularly in the back on the right side, to the ventral compact layer. On the occipital this compact layer shows a number of small perforations, apparently the result of inflammation or suppuration. There is nowhere in the grooves or in their vicinity any hypertrophy of the bone tissue, but there are numerous places which show what appears to be slight repair, from which it would seem that the injury was inflicted during the life of the individual, who

survived for some time at least. The outline of the main groove over the frontal and parietals surrounds in an irregular circular way the crown of the head, and might suggest a crude attempt at scalping; but there are grooves also within this circle, particularly one along the sagittal suture. Nothing suggests that the injury might be due to the growth of roots or to the gnawing of animals. Possibly further specimens from the same region will shed light on the exact nature of the peculiarity. (See fig. 8.)

Besides the two skulls noted above, Mr Gilder presented to the National Museum two pieces of an adult male skull, both of which are calcined, due possibly to the cremation of a captive. There are, furthermore, three long-bones which proceeded from the left side of apparently the same individual. The femur measures 44.4 cm. in length and shows a pronounced platymery (3.45×2.6 cm. at the greatest breadth of the subtrochanteric flattening), and it also shows a well-developed third trochanter. The shape of the shaft, in transverse section at the middle, is intermediary between triangular and rounded (1-R); linea aspera well-developed.

The left tibia is of moderate length; diameters at middle 3.4×2.1 cm., showing moderate platycnemism; shape of transverse section of shaft at middle, 4; prominent popliteal ridge.

The left humerus, 31.8 cm. long, measures 2.4×1.8 cm. at the middle; shape of transverse section of shaft at middle, 1-4; no anomalies.

The bones indicate a male adult of moderate stature, and good but not excessive muscularity development.

U. S. NATIONAL MUSEUM,
WASHINGTON.